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CLAIMS

1. A method for controlling feeding of solid matter in a process which comprises at least one unloading point (UP) for solid matter, at least one belt conveyor (2, 2', 3, 5) and at least one feeding point (SP) for solid matter, solid matter being unloaded in the unloading point (UP) from solid matter storage to a belt conveyor (2, 2'), which is arranged to convey said solid matter either directly or via at least one other belt conveyor (3, 5) to the feeding point (SP), **characterized** by

determining a set value for the thickness of a material bed formed of the solid matter to be unloaded to the belt conveyor (2, 2');

controlling the unloading of the solid matter to the belt conveyor (2, 2') in the unloading point (UP) in such a way that the thickness of the material bed follows said set value;

determining a material bed profile (PROF) expressing variation in the thickness of the material bed in the longitudinal direction of the belt conveyor (2, 2', 3, 5);

determining the material flow travelling on the belt conveyor (2, 2', 3, 5) on the basis of said profile (PROF); and

controlling in the feeding point (SP) the amount of solid matter to be fed by controlling the speed (S) of the belt conveyor (2, 2', 3, 5).

2. A method according to claim 1, **characterized** by feeding solid matter in the feeding point (SP) to solid matter intermediate storage, storage tank or a solid matter treatment process, from which intermediate storage or storage tank said solid matter is unloaded for further treatment, or said solid matter discharges passively for further treatment, or in which treatment process said solid matter is treated further.

3. A method according to claim 1 or 2, **characterized** by the thickness of the material bed formed of solid matter being the mass of the solid matter per length unit of the belt conveyor (2, 2', 3, 5), the volume of the solid matter per length unit of the belt conveyor (2, 2', 3, 5) or the cross-sectional area of the material bed formed of solid matter.

4. A method according to any one of the preceding claims, **characterized** by

determining an amount target (CU_{SP}) for the solid matter to be fed to the intermediate storage, storage tank or treatment process on the basis of the

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amount of solid matter discharged from the intermediate storage or the amount of solid matter treated in the treatment process;

controlling the amount of solid matter to be fed in the feeding point (SP) on the basis of the amount target for the solid matter by adjusting the speed (S) of the belt conveyor (2, 2', 3, 5) on the basis of the amount target (CU_{SP}) for the solid matter; and

controlling the unloading speed (SU) of the solid matter unloaded to the belt conveyor (2, 2') in the unloading point (UP) on the basis of the speed (S) of the belt conveyor (2, 2') in such a way that the thickness of the material bed formed of the solid matter unloaded to the belt conveyor (2, 2') follows the set value set for the material bed thickness.

5. A method according to any one of the preceding claims, **characterized** by the set value of the thickness of the material bed of the solid matter unloaded to the belt conveyor (2, 2') being a permanently fixed constant value.

6. A method according to any one of the preceding claims, **characterized** by defining a material bed profile (PROF) expressing variation in the thickness of the material bed of the solid matter on the belt conveyor (2, 2', 3, 5) in the longitudinal direction of the belt conveyor (2, 2', 3, 5) on the basis of the speed (S) of the belt conveyor (2, 2', 3, 5) and the speed (SU) of the unloader (1, 1').

7. A method according to claim 6, **characterized** by defining a variable (M_{CU}, M_C) expressing the weight of the solid matter on the belt conveyor (2, 2', 3, 5); and updating the profile (PROF) of the material bed formed of the solid matter at a particular point of the belt conveyor (2, 2', 3, 5) on the basis of the variable (M_{CU}, M_C) expressing the weight of the solid matter on the belt conveyor.

8. A method according to claim 6 or 7, **characterized** by combining solid matter kind and/or grade information with the material bed profile (PROF) expressing variation in the thickness of the material bed of the solid matter on the belt conveyor (2, 2', 3, 5) in the longitudinal direction of the belt conveyor (2, 2', 3, 5).

9. A method according to any one of the preceding claims, **characterized** by the solid matter being of chips and the intermediate storage being a chip silo (6).

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10. A method according to any one of claims 1 to 8, **characterized** by the solid matter being solid fuel and the solid matter treating process being a power boiler, where solid matter is combusted for producing energy.

11. A method according to claim 1 to 8, **characterized** by the solid matter being of rock, concrete and/or asphalt and the solid matter treating process being a crushing, screening and/or mixing process.

12. An apparatus for controlling feeding of solid matter in a process which comprises at least one unloading point (UP) for solid matter, at least one belt conveyor (2, 2', 3, 5) and at least one feeding point (SP) for solid matter, solid matter being arranged to be unloaded in the unloading point (UP) from solid matter storage to a belt conveyor (2, 2'), which is arranged to convey said solid matter either directly or via at least one other belt conveyor (3, 5) to the feeding point (SP), **characterized** in that the apparatus is arranged

to determine a set value for the thickness of a material bed formed of the solid matter to be unloaded to the belt conveyor (2, 2');

to control the unloading of the solid matter to the belt conveyor (2, 2') in the unloading point (UP) in such a way that the thickness of the material bed follows said set value;

to determine a material bed profile (PROF) expressing variation in the thickness of the material bed in the longitudinal direction of the belt conveyor (2, 2', 3, 5);

to determine the material flow travelling on the belt conveyor (2, 2', 3, 5) on the basis of said profile (PROF); and

to control the amount of solid matter to be fed in the feeding point (SP) by controlling the speed (S) of the belt conveyor (2, 2', 3, 5).

13. An apparatus according to claim 12, **characterized** in that in the feeding point (SP) the solid matter is arranged to be fed to solid matter intermediate storage, storage tank or a solid matter treatment process, from which intermediate storage said solid matter is arranged to be unloaded or said solid matter is arranged to discharge passively for further treatment, or in which treatment process said solid matter is arranged to be treated further.

14. An apparatus according to claim 12 or 13, **characterized** in that the thickness of the material bed formed of solid matter is the mass of the solid matter per length unit of the conveyor (2, 2', 3, 5), the volume of the

solid matter per length unit of the belt conveyor (2, 2', 3, 5) or the area of the cross-section of the material bed formed of solid matter.

15. An apparatus according to claim 12 to 14, **characterized** in that

the apparatus is arranged to determine an amount target (CU_{SP}) for the solid matter to be fed to the intermediate storage or treating process on the basis of the amount of solid matter exiting from the intermediate storage or storage tank or the amount of solid matter treated in the treatment process;

the apparatus is arranged to control the amount of solid matter to be fed in the feeding point (SP) by adjusting the speed (S) of the belt conveyor (2, 2', 3, 5) on the basis of the amount target (CU_{SP}) for the solid matter; and that

the apparatus is arranged to control the unloading speed (SU) of the solid matter unloaded to the belt conveyor (2, 2') in the unloading point (UP) on the basis of the speed (S) of the belt conveyor (2, 2') in such a way that the thickness of the material bed formed of the solid matter unloaded to the belt conveyor (2, 2') follows the set value set for the thickness of the material bed.

16. An apparatus according to any one of claims 12 to 15, **characterized** in that the set value of the thickness of the material bed of the solid matter unloaded to the belt conveyor (2, 2') is a permanently fixed constant value.

17. An apparatus according to any one of claims 12 to 16, **characterized** in that the apparatus is further arranged to define a material bed profile (PROF) expressing variation in the thickness of the material bed of the solid matter on the belt conveyor (2, 2', 3, 5) in the longitudinal direction of the belt conveyor (2, 2', 3, 5) on the basis of the speed (S) of the belt conveyor (2, 2', 3, 5) and the speed (SU) of the unloader (1, 1').

18. An apparatus according to claim 17, **characterized** in that the apparatus comprises means for determining a variable (M_C, M_{CU}) expressing the weight of the solid matter on the belt conveyor (2, 2', 3, 5); and that the apparatus is arranged to update the profile (PROF) of the material bed of the solid matter being at a given point of the belt conveyor (2, 2', 3, 5) on the basis of the variable (M_C, M_{CU}) expressing the weight of the solid matter on the belt conveyor (2, 2', 3, 5).

19. An apparatus according to any one of claims 17 or 18, **characterized** in that the apparatus is arranged to combine solid matter kind and/or grade information with the material bed profile (PROF)

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expressing variation in the thickness of the material bed of the solid matter on the belt conveyor (2, 2', 3, 5).

20. An apparatus according to any one of claims 12 to 19, **characterized** in that the solid matter is formed of chips and that the intermediate storage is a chip silo (6).

21. An apparatus according to any one of claims 12 to 19, **characterized** in that the solid matter is solid fuel and that the treatment process of the solid matter is a power boiler, where the solid matter is arranged to be combusted for producing energy.

22. An apparatus according to any one of claims 12 to 19, **characterized** in that the solid matter is rock, concrete and/or asphalt and that the solid matter treatment process is a crushing, screening and/or mixing process.